

In re Patent Application of
BAHLENBERG ET AL.
Serial No. 09/529,427
Filed: NOVEMBER 1, 2000

In the Claims:

This listing of claims replaces all prior versions
and listing of claims in the application.

Claims 1-16. (canceled).

17. (new) A hybrid circuit for use with a duplex transmission system using Frequency Divided Duplex (FDD) and Orthogonal Frequency Divided Duplex (OFDD), for interconnecting a two wire receive path having an A/D converter and a two wire transmit path having a D/A converter to a two wire transmission line, the hybrid circuit comprising:

a balanced 2-wire to 4-wire hybrid for interconnecting the two wire receive path and the two wire transmit path to the two wire transmission line; and

a filter connected between the balanced hybrid and the A/D converter in the receive path to remove transmit signals originating from the D/A converter.

18. (new) A hybrid circuit according to Claim 17, wherein FDD is used for relatively longer transmission lines and OFDD is used for relatively shorter transmission lines.

19. (new) A hybrid circuit according to Claim 17, wherein the duplex transmission system includes all transmitters in Optical Network Units (ONUs) and Network Terminations (NTs) being time synchronized, timing advance for transmissions being calculated from line lengths, different

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sub-carriers being used for up-stream and downstream transmissions, a cyclic prefix being added to transmissions to compensate for delay propagation in transmission lines, and frequencies above an FDD band are not used for longer lines.

20. (new) A hybrid circuit according to Claim 19, wherein the cyclic prefix is dimensioned for lines equal to and longer than length X and OFDD is used for lines shorter than length X.

21. (new) A hybrid circuit according to Claim 20 wherein the balanced hybrid and the filter, together, introduce a delay less than a delay for which the cyclic prefix is dimensioned.

22. (new) A duplex transmission system comprising a plurality of hybrid circuits according to Claim 17.

23. (new) A hybrid circuit for use with a duplex transmission system using Frequency Divided Duplex (FDD) and Orthogonal Frequency Divided Duplex (OFDD), for interconnecting a receive path having an A/D converter and a transmit path having a D/A converter to a transmission line, the hybrid circuit comprising:

a hybrid for interconnecting the receive path and the transmit path to the transmission line; and

a filter connected between the hybrid and the A/D converter in the receive path to remove transmit signals originating from the D/A converter.

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24. (new) A hybrid circuit according to Claim 23, wherein FDD is used for relatively longer transmission lines and OFDD is used for relatively shorter transmission lines.

25. (new) A duplex transmission system comprising a plurality of hybrid circuits according to Claim 23.

26. (new) A method for interconnecting a receive path having an A/D converter and a transmit path having a D/A converter to a transmission line in a duplex transmission system using Frequency Divided Duplex (FDD) and Orthogonal Frequency Divided Duplex (OFDD), the method comprising:

interconnecting the receive path and the transmit path to the transmission line with a hybrid; and

removing transmit signals originating from the D/A converter with a filter connected between the hybrid and the A/D converter in the receive path.

27. (new) A method according to Claim 26 wherein the hybrid comprises a balanced 2-wire to 4-wire hybrid for interconnecting a two wire receive path and a two wire transmit path to a two wire transmission line.